

Summary of Survey 2 Results

INTERIOR PLATEAU (REGION 5)

*Objective of Survey 2: To inform the status of specific threats and importance of various conservation actions for **habitats** within individual **planning regions** in Indiana (Elements 3 and 4)*

Survey About Threats to and Conservation Needs for Fish and Wildlife Habitats in Indiana

— In Support of the 2015 Indiana State Wildlife Action Plan—



Flow of Survey 2:

1. Introduction
2. Planning region and habitat selection
3. Status and trends in habitat
4. Threats and trends of threats to habitats
5. Conservation actions for habitats
6. Relative ranking of conservation actions in each planning region
7. Organizational adaptation and evaluation
8. Additional Comments

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Survey 2 Participation Rates

Sent online to directly to 972 conservation professionals, stakeholders, species experts, property managers, etc.

“Open” link provided for other individuals to participate

Recorded 362 full and partial responses

- 285 direct distribution
- 77 open link

For which of the following SWAP planning regions do you consider yourself knowledgeable to provide information on the status of, threats to, and relevant conservation actions for fish and wildlife habitats?

Interior Plateau (Region 5) – 27.7% (80)

Habitat type:	Proportion of respondents:	N:
Aquatic systems	41.3%	33
Agricultural lands	36.3%	16
Barren lands	20.0%	16
Developed Lands	16.3%	13
Forests	78.8%	63
Grasslands	26.3%	21
Subterranean systems	18.8%	15
Wetlands	37.5%	30

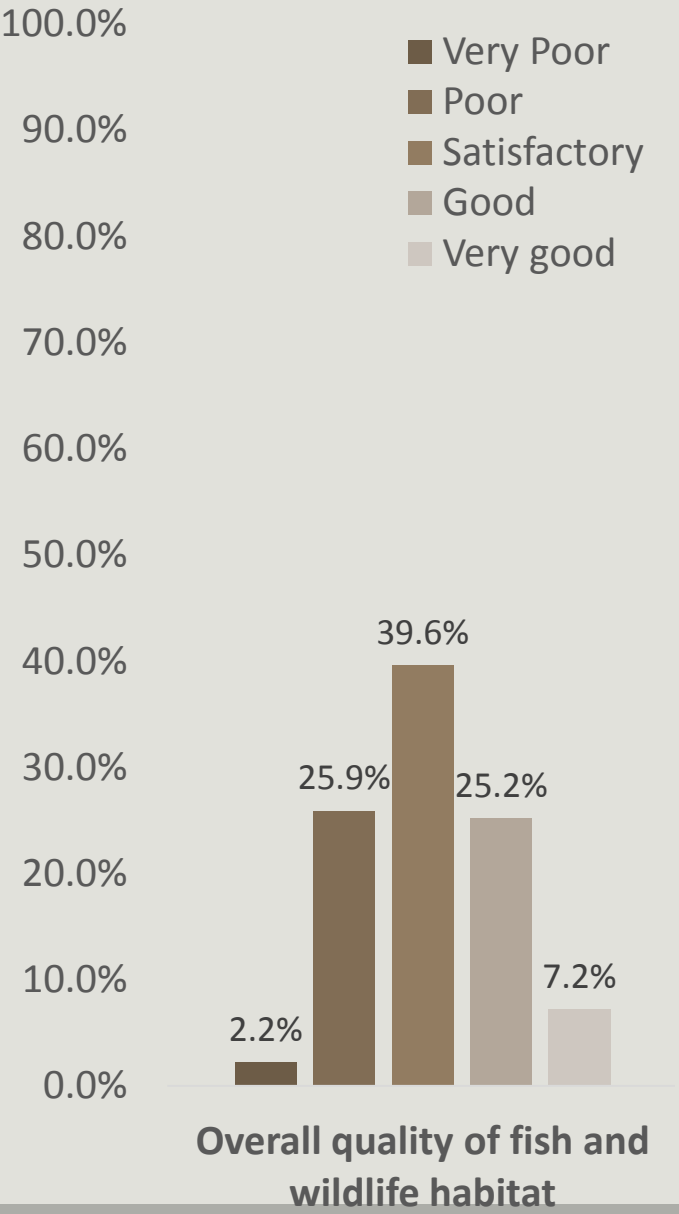
*Summary of trends in **habitat** within the Interior Plateau (Region 5)*

11. How would you describe the **overall quality** of fish and wildlife habitats within **HABITAT** in the REGION?

12. How would you describe the total amount and overall quality of fish and wildlife habitats within **HABITAT** in the REGION since 2005?

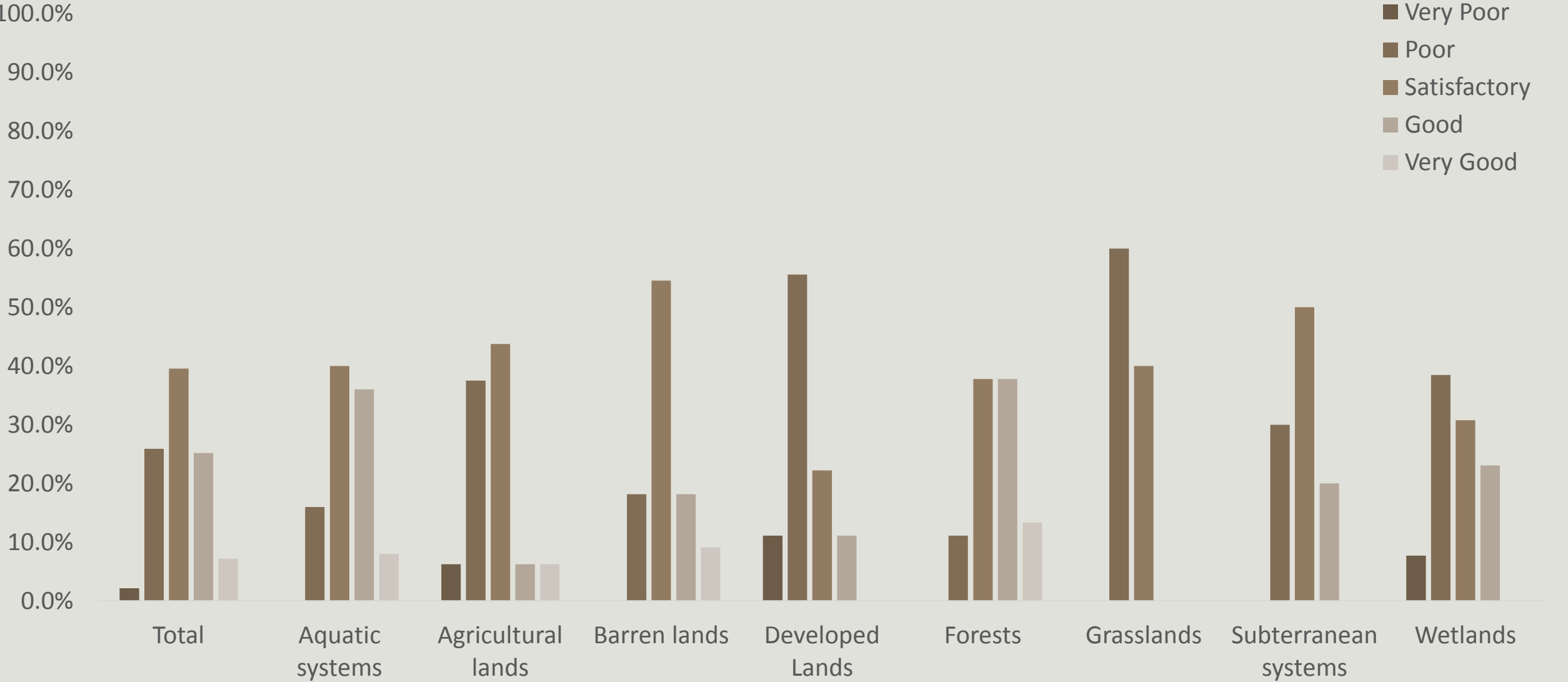
13. How would you predict about the total amount and overall quality of fish and wildlife habitats within **HABITAT** in the REGION over the next 10 years? (Check one for each line item)

Summary of Habitat Status in the Interior Plateau (Region 5)



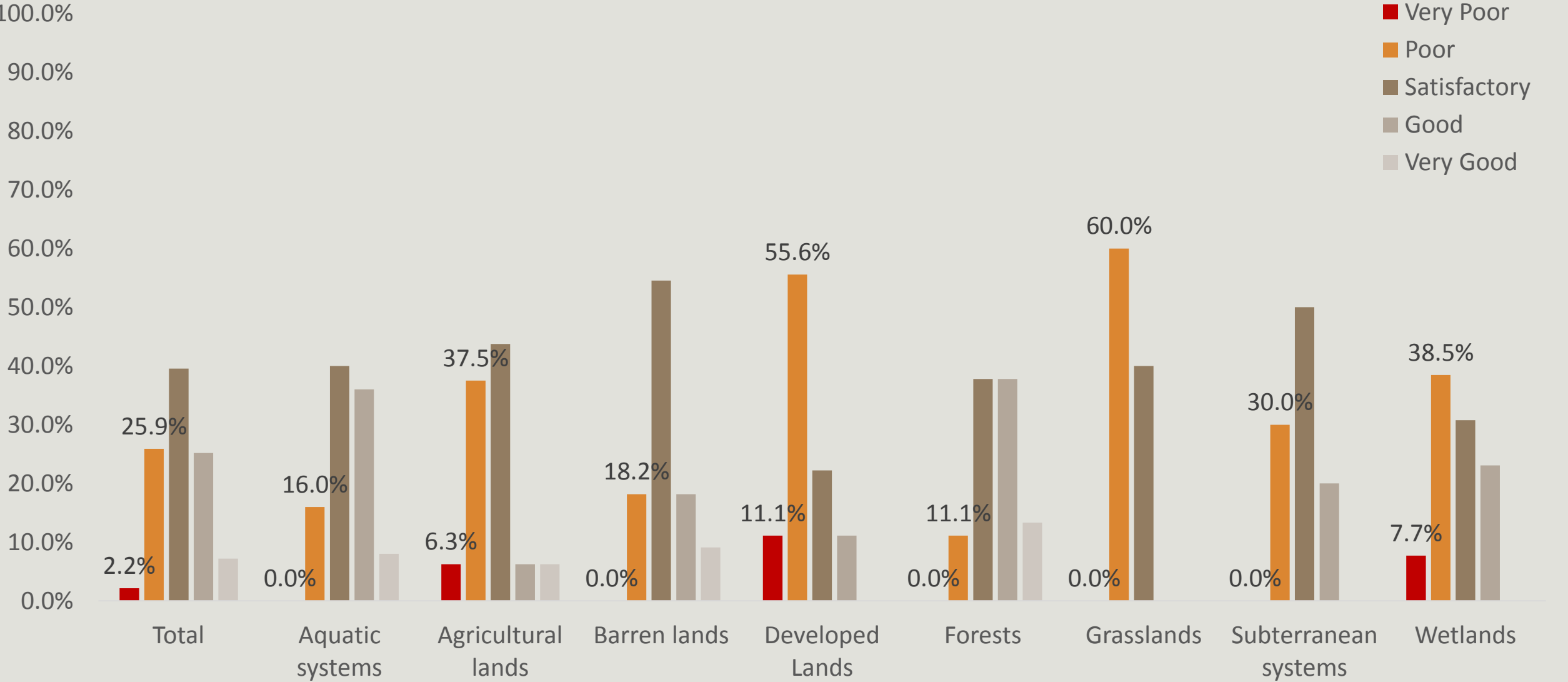
Overall Quality of Fish and Wildlife Habitats

- Very Poor
- Poor
- Satisfactory
- Good
- Very Good



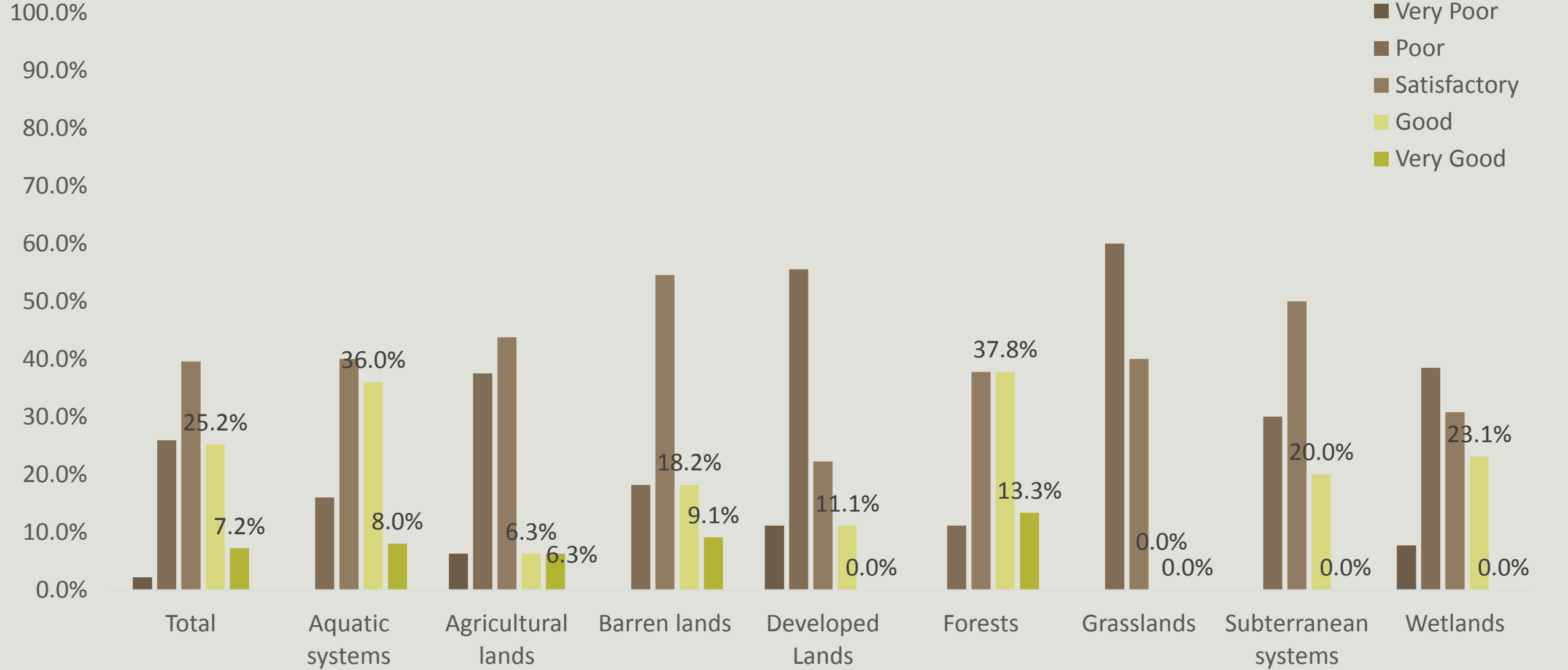
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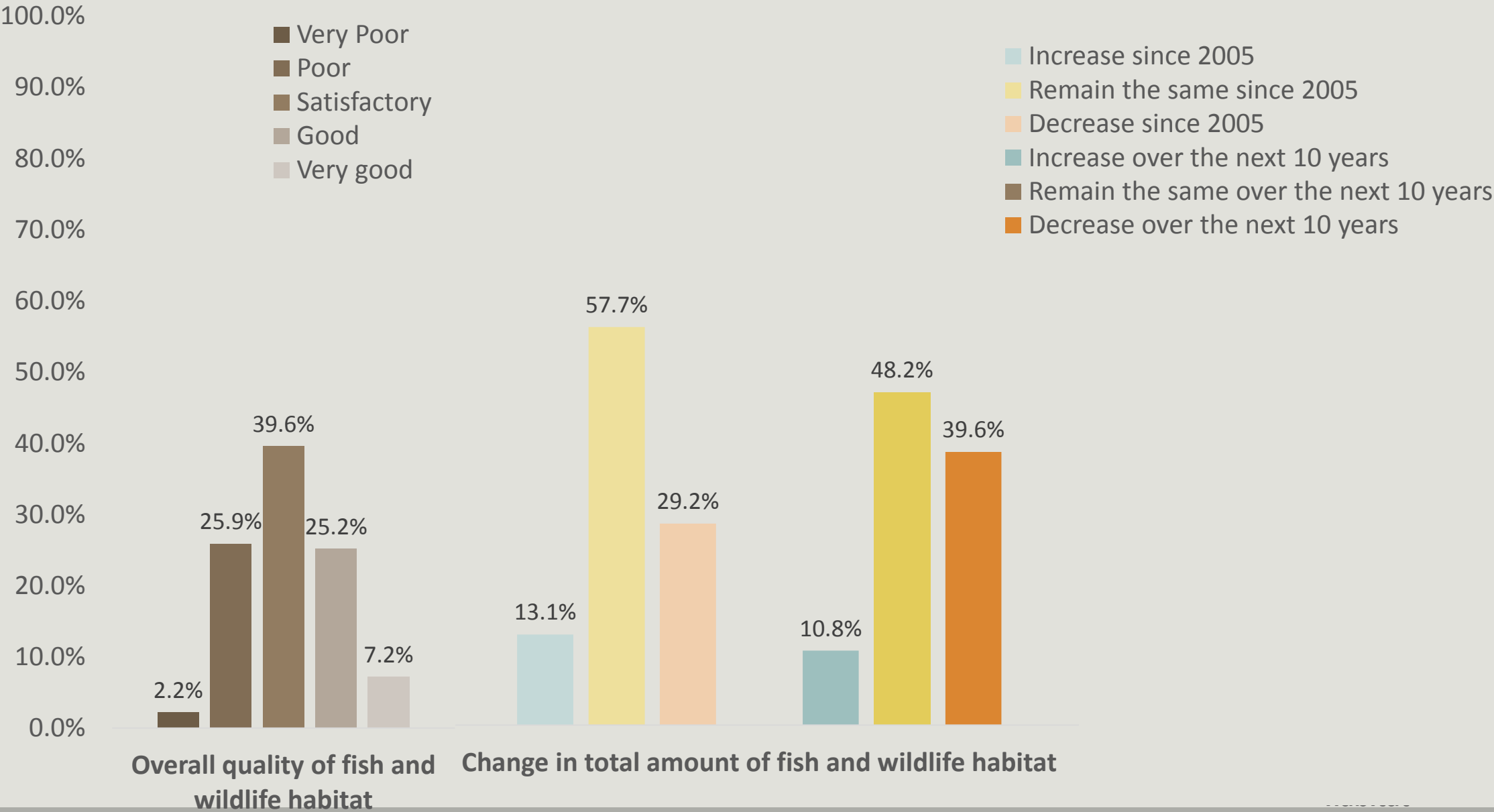


Overall Quality of Fish and Wildlife Habitats

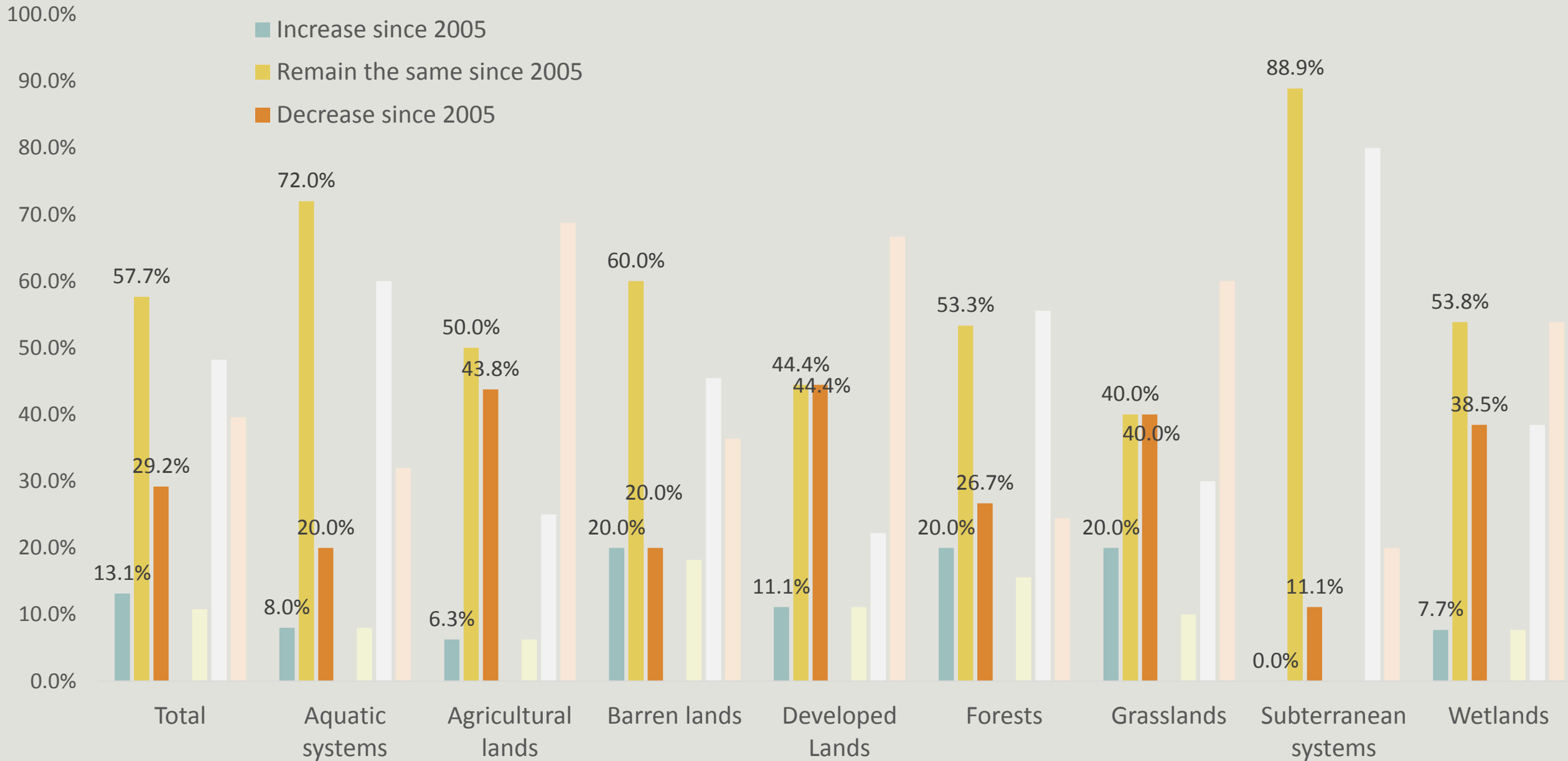
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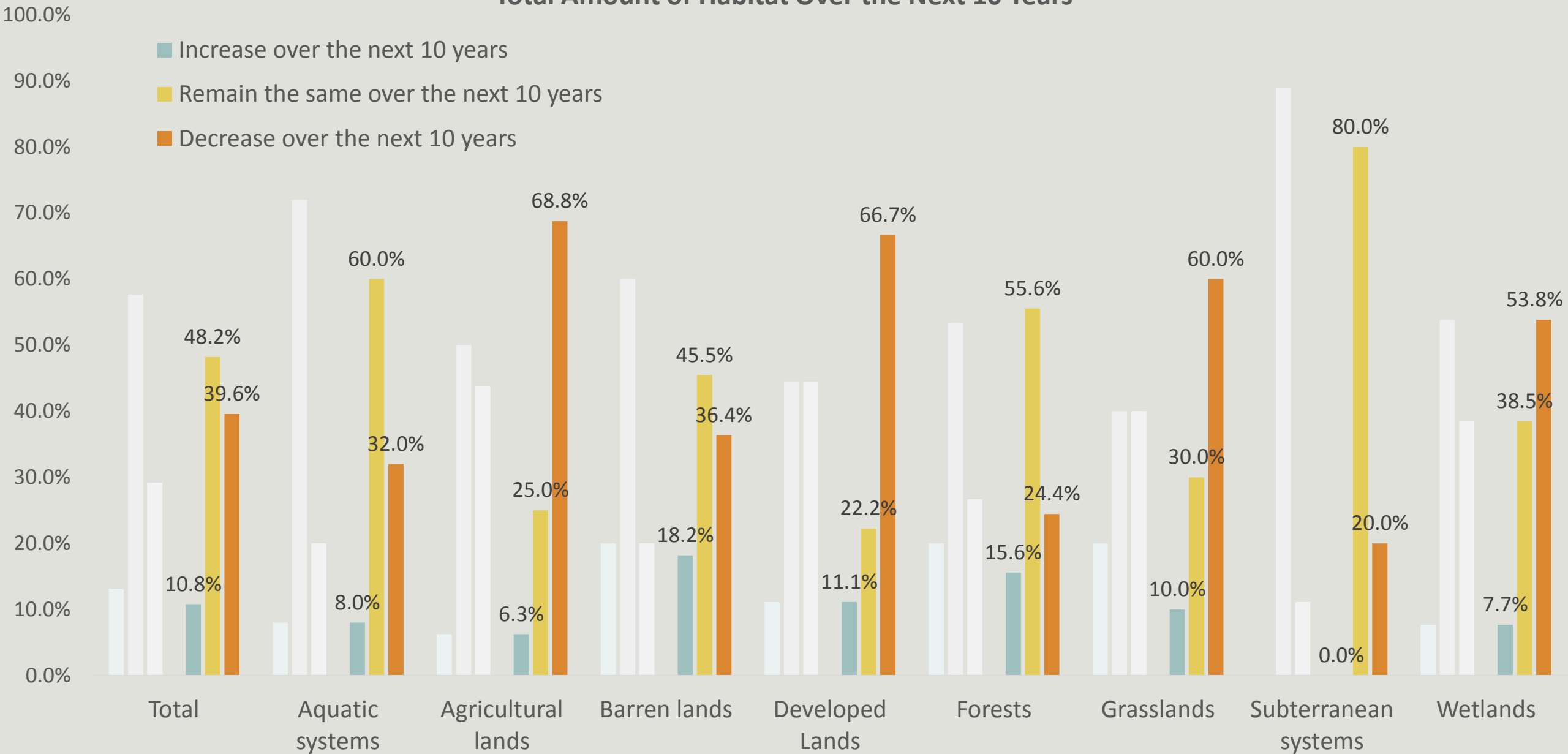
Summary of Habitat Status in the Interior Plateau (Region 5)



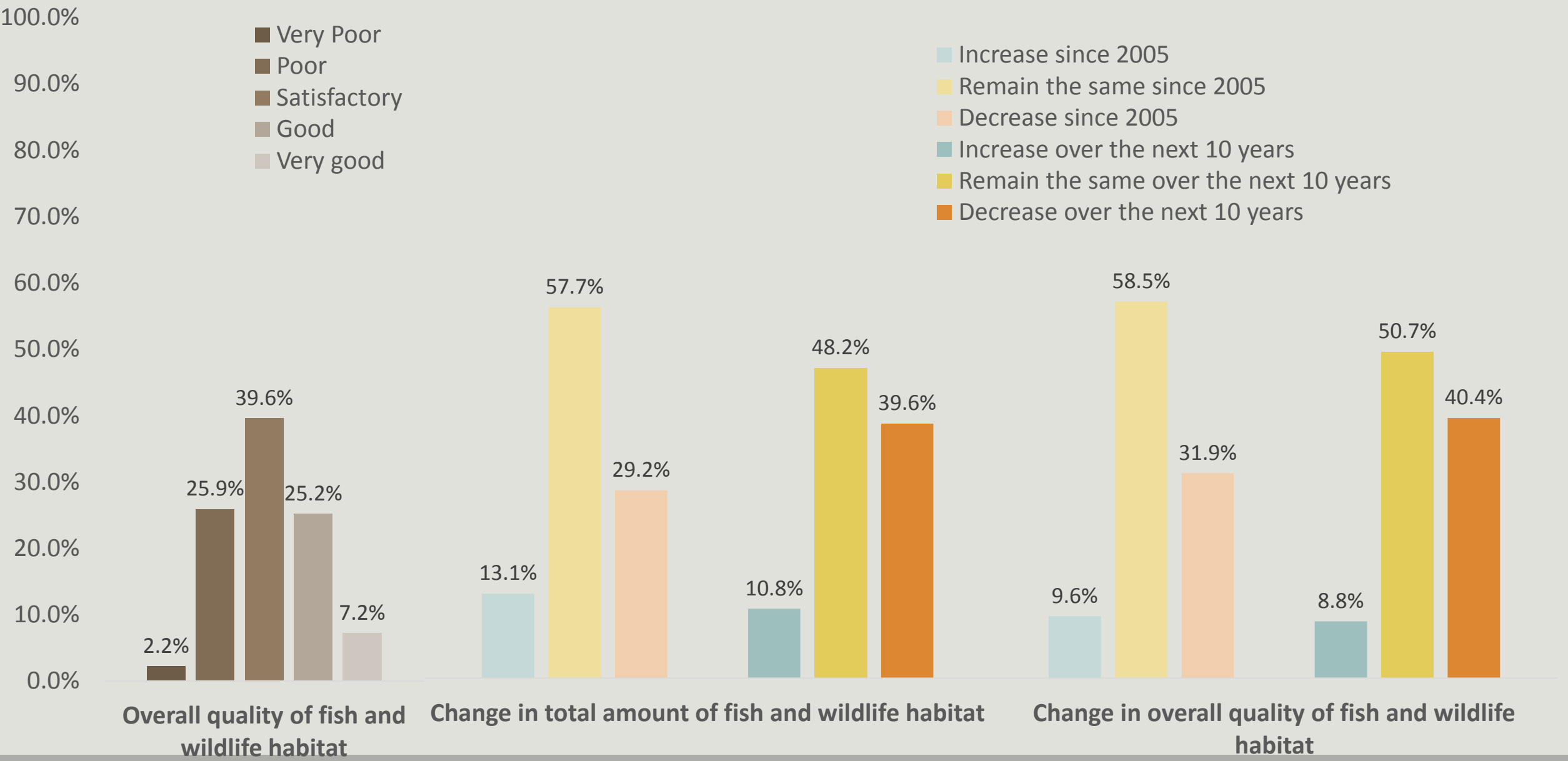
Total Amount of Habitat Since 2005



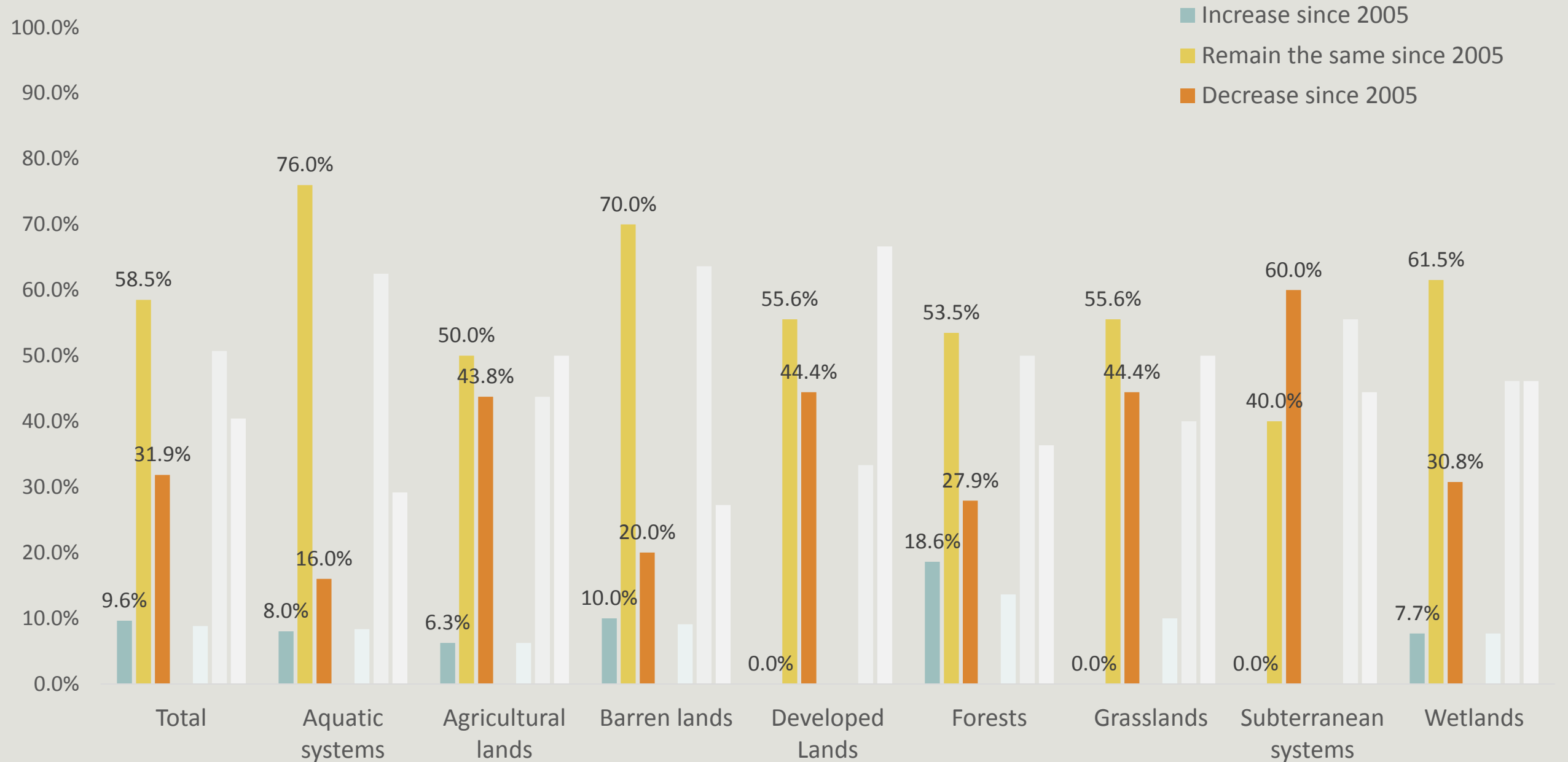
Total Amount of Habitat Over the Next 10 Years



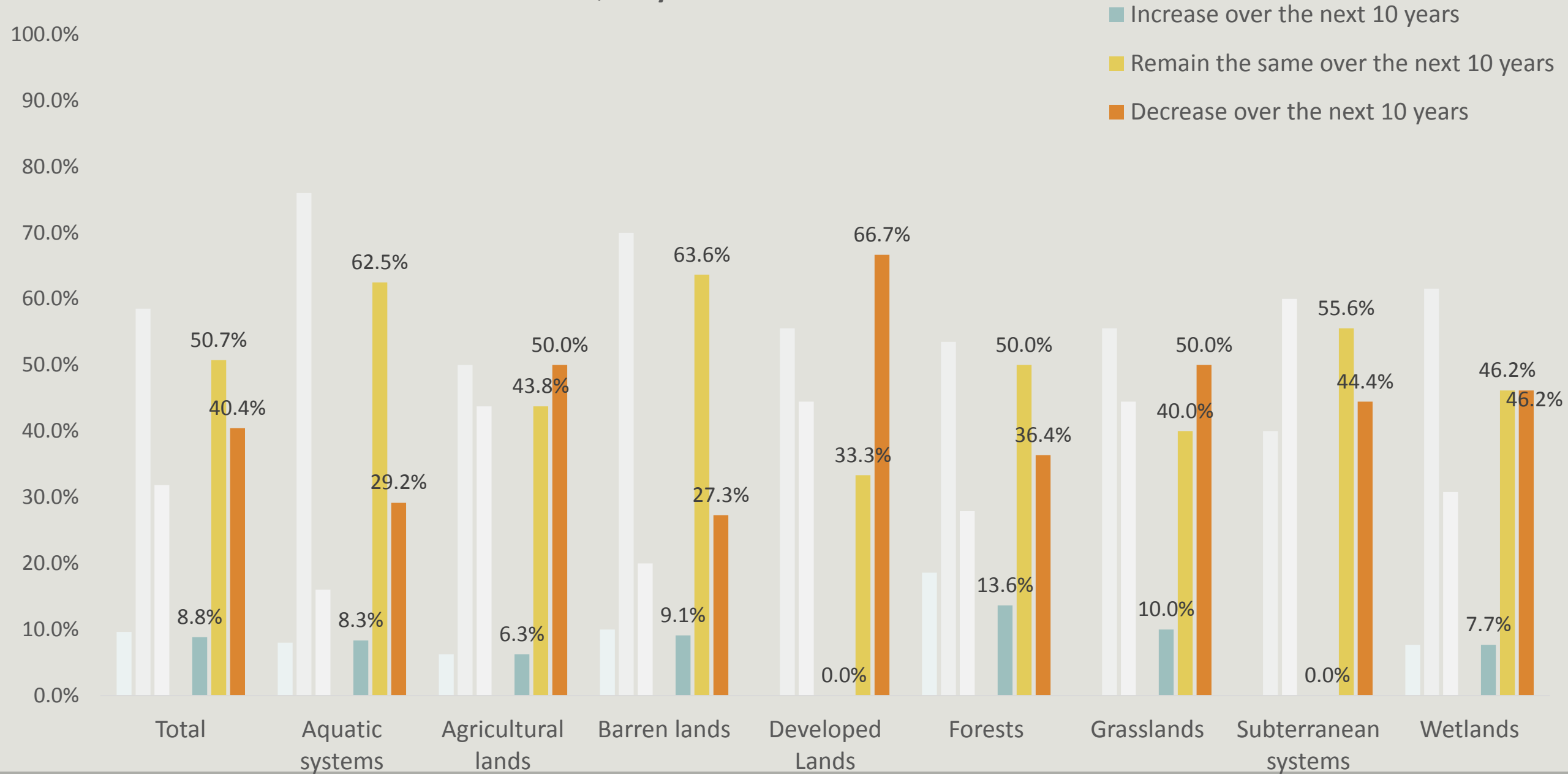
Summary of Habitat Status in the Interior Plateau (Region 5)



Overall Quality of Habitat Since 2005



Overall Quality of Habitat Over the Next 10 Years



Threats to Habitats in Interior Plateau (Region 5)

Broad Threat Category



Category Ranking



Specific threats, ranking
and anticipated changes

Agriculture and
Aquaculture



Significant Threat



Conversion of habitat to annual crops
Annual and perennial nontimber crops
Livestock farming and ranching
Wood and pulp plantations
Aquaculture

Energy Production and
Mining



Moderate Threat



Mining and quarrying
Fossil fuel energy production
Oil and gas drilling
Shale gas development (e.g., fracking)
Renewable energy production

Residential and
Commercial Development



Minor Threat



Housing and urban areas
Commercial and industrial areas
Tourism and recreation areas (e.g., sites
with a substantial footprint – golf
courses, campgrounds, etc.)

Agriculture and
Aquaculture



Significant Threat



Conversion of habitat to annual crops
Annual and perennial nontimber crops
Livestock farming and ranching
Wood and pulp plantations
Aquaculture



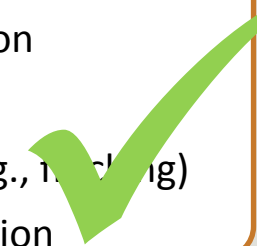
Energy Production and
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Moderate Threat



Mining and quarrying
Fossil fuel energy production
Oil and gas drilling
Shale gas development (e.g., fracking)
Renewable energy production



Residential and
Commercial Development



Minor Threat



Housing and urban areas
Commercial and industrial areas
Tourism and recreation areas (e.g., golf courses, campgrounds, etc.)



Threat Category:	Rating as “significant” or “moderate” threat:	N:
Residential and commercial development	79.9%	107
Invasives and other problematic species and genes	77.7%	101
Agriculture and aquaculture	70.2%	92
Natural systems modifications	63.2%	79
Pollution	61.9%	78
Human intrusion and disturbance	60.9%	78
Transportation and service corridors	54.6%	71
Other stressors	49.5%	47
Climate change and severe weather	47.6%	59
Energy production and mining	40.5%	51
Biological resource use	33.1%	40

Threat Category:	Rating as “significant” or “moderate” threat:	N:
Residential and commercial development	79.9%	107
Invasives and other problematic species and genes	77.7%	101
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Climate change and severe weather	47.6%	59
Energy production and mining	40.5%	51
Biological resource use	33.1%	40

Threat Category:	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass-lands	Subterranean systems	Wet-lands
Residential and commercial development	1st	2nd - Tie	1st	3rd	1st	1st	3rd	2nd	5th - Tie
Invasives and other problematic species and genes	2nd	2nd - Tie	2nd	1st	3rd	2nd	2nd	6th	1st - Tie
Agriculture and aquaculture	3rd	1st	3rd - Tie	6th - Tie	4th - Tie	3rd	1st	4th - Tie	5th - Tie
Natural systems modifications	4th	5th	3rd - Tie	4th - Tie	4th - Tie	5th	7th - Tie	7th	3rd
Pollution	5th	4th	5th - Tie	6th - Tie	2nd	9th	5th	1st	1st - Tie
Human intrusion and disturbance	6th	6th	5th - Tie	6th - Tie	6th - Tie	4th	7th - Tie	3rd	4th
Transportation and service corridors	7th	8th	3rd - Tie	10th	10th - Tie	6th	6th	4th - Tie	7th
Other stressors	8th	9th	9th	2nd	6th - Tie	8th	4th	8th	9th
Climate change and severe weather	9th	7th	11th	4th - Tie	8th -Tie	7th	11th	9th - Tie	8th
Energy production and mining	10th	10th	8th	6th - Tie	10th - Tie	10th	10th	9th - Tie	11th
Biological resource use	11th	11th	10th	11th	8th -Tie	11th	7th - Tie	11th	10th

Threat Category:	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass-lands	Subterranean systems	Wet-lands
Residential and commercial development	1st	2nd - Tie	1st	3rd	1st	1st	3rd	2nd	5th - Tie
Invasives and other problematic species and genes	2nd	2nd - Tie	2nd	1st	3rd	2nd	2nd	6th	1st - Tie
Agriculture and aquaculture	3rd	1st	3rd - Tie	6th - Tie	4th - Tie	3rd	1st	4th - Tie	5th - Tie
Natural systems modifications	4th	5th	3rd - Tie	4th - Tie	4th - Tie	5th	7th - Tie	7th	3rd
Pollution	5th	4th	5th - Tie	6th - Tie	2nd	9th	5th	1st	1st - Tie
Human intrusion and disturbance	6th	6th	5th - Tie	6th - Tie	6th - Tie	4th	7th - Tie	3rd	4th
Transportation and service corridors	7th	8th	3rd - Tie	10th	10th - Tie	6th	6th	4th - Tie	7th
Other stressors	8th	9th	9th	2nd	6th - Tie	8th	4th	8th	9th
Climate change and severe weather	9th	7th	11th	4th - Tie	8th -Tie	7th	11th	9th - Tie	8th
Energy production and mining	10th	10th	8th	6th - Tie	10th - Tie	10th	10th	9th - Tie	11th
Biological resource use	11th	11th	10th	11th	8th -Tie	11th	7th - Tie	11th	10th

Highest Ranked Threats

Threat Category:	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass-lands	Subterranean systems	Wet-lands
Residential and commercial development	1st	2nd - Tie	1st	3rd	1st	1st	3rd	2nd	5th - Tie
Invasives and other problematic species and genes	2nd	2nd - Tie	2nd	1st	3rd	2nd	2nd	6th	1st - Tie
Agriculture and aquaculture	3rd	1st	3rd - Tie	6th - Tie	4th - Tie	3rd	1st	4th - Tie	5th - Tie
Natural systems modifications	4th	5th	3rd - Tie	4th - Tie	4th - Tie	5th	7th - Tie	7th	3rd
Pollution	5th	4th	5th - Tie	6th - Tie	2nd	9th	5th	1st	1st - Tie
Human intrusion and disturbance	6th	6th	5th - Tie	6th - Tie	6th - Tie	4th	7th - Tie	3rd	4th
Transportation and service corridors	7th	8th	3rd - Tie	10th	10th - Tie	6th	6th	4th - Tie	7th
Other stressors	8th	9th	9th	2nd	6th - Tie	8th	4th	8th	9th
Climate change and severe weather	9th	7th	11th	4th - Tie	8th -Tie	7th	11th	9th - Tie	8th
Energy production and mining	10th	10th	8th	6th - Tie	10th - Tie	10th	10th	9th - Tie	11th
Biological resource use	11th	11th	10th	11th	8th -Tie	11th	7th - Tie	11th	10th

Lowest Ranked Threats

15. You indicated a number of general categories as significant or moderate threats to fish and wildlife habitats within **HABITAT** in the Interior Plateau (Region 5). Please indicate which of the following are specific threats to fish and wildlife habitats within HABITAT in the Interior Plateau (Region 5).

Residential and Commercial Development – 1st

Threats from human settlements or other nonagricultural land uses with a substantial footprint

Specific Threat:	Rating as significant or moderate:	N:	Trend:
Housing and urban areas	84.8%	89	Increase
Commercial and industrial areas	77.6%	76	Increase
Tourism and recreation areas (e.g., sites with a substantial footprint – golf courses, campgrounds, etc.)	40.6%	41	Increase

Invasives and Other Problematic Species/Genes – 2nd

Threats from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread, and/or increase in abundance

Specific Threat:	Rating as significant or moderate:	N:	Trend:
Invasive/alien species	96.9%	95	Increase
Problematic native species (e.g. overabundant native deer or algae)	64.6%	62	Increase
Plant diseases	60.0%	51	Increase
Introduced genetic material (such as crop, seed stock, biocontrol, stocked/released species, etc.)	47.5%	38	Increase

Agriculture and Aquaculture – 3rd

Threats from farming and ranching as a result of agricultural expansion and intensification, including silviculture, mariculture, and aquaculture

Specific Threat:	Rating as significant or moderate:	N:	Trend:
Conversion of habitat to annual crops	82.6%	71	Increase
Annual and perennial nontimber crops	67.0%	59	Remain the same
Livestock farming and ranching	64.3%	54	Remain the same
Wood and pulp plantations	36.8%	28	Remain the same
Aquaculture	10.5%	6	Remain the same

Natural Systems Modification – 4th

Threats from human activities that alter, destroy, and disturb habitats and species associated with nonconsumptive uses of biological resources

Specific Threat:	Rating as significant or moderate:	N:	Trend
Conversion of natural habitats to other land uses	96.2%	76	Increase
Dams and water management/use	56.8%	42	Remain the same
Fire and fire suppression	46.6%	34	Remain the same
Over-mowing of natural areas	40.8%	29	Remain the same
Log jam removal	28.2%	20	Remain the same

Pollution— 5th

Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources

Specific Threat:	Rating as significant or moderate:	N:	Trend
Agriculture, residential, and forestry effluents	82.9%	63	Increase
Runoff from roads/service corridors	71.1%	54	Increase
Point source pollution from commercial/industrial sources	71.1%	54	Remain the same
Air pollution (e.g., smoke, mercury emissions)	70.8%	51	Increase
Household sewage and urban water waste	65.8%	50	Increase
Garbage and solid waste	61.1%	44	Increase
Chemical spills	55.4%	41	Remain the same
Excess energy (e.g., noise/light pollution, warm water discharge, etc.)	52.8%	38	Increase

Human Intrusion and Disturbance – 6th

Threats from human activities that alter, destroy, and disturb habitats and species associated with nonconsumptive uses of biological resources.

Specific Threat:	Rating as significant or moderate:	N:	Trend:
Recreation activities (e.g., ATVs, trail use, horseback riding, high-speed boating, canoeing)	67.5%	52	Increase

Transportation and Service Corridors – 7th

Threats from long, narrow transport corridors and the vehicles that use them, including associated wildlife mortality

Specific Threat:	Rating as significant or moderate:	N:	Trend
Roads and railroads	85.1%	57	Increase
Utility and service lines	55.7%	39	Remain the same
Shipping lanes	21.3%	13	Remain the same
Flight paths	16.1%	10	Remain the same

Remaining Threat Categories

- 8. **Other stressors:** *Additional threats and stressors directly affecting habitats, such as diseases and genetic diversity issues*
- 9. **Climate change and severe weather:** *Long-term climactic changes that may be linked to global warming and other severe climactic or weather events outside the natural range of variation that could wipe out vulnerable species or habitat.*
- 10. **Energy production and mining:** *Threats from production of nonbiological resources*
- 11. **Biological resource use:** *Threats from consumptive use of “wild” biological resources including deliberate and unintentional harvesting effects; also persecution or control of specific species*

Conservation Actions for Habitats in the Interior Plateau (Region 5)

Broad Action Category

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graph TD; A[Broad Action Category] --> B[Category Ranking]; B --> C[Actions for Habitat A]; B --> D[Actions for Habitat B];
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The diagram is a flowchart with a light gray background. It starts with a white rounded rectangle at the top containing the text 'Broad Action Category'. A thin vertical line descends from the center of this box to the top of a second, wider white rounded rectangle below it, which contains the text 'Category Ranking'. From the bottom of the 'Category Ranking' box, two large, thick orange arrows point downwards and outwards to two separate white rounded rectangles at the bottom. The left arrow points to a box containing 'Actions for Habitat A', and the right arrow points to a box containing 'Actions for Habitat B'. All boxes have a thin orange border.

Category Ranking

Actions for
Habitat A

Actions for
Habitat B

17. Please indicate the importance of the following general categories of conservation actions for fish and wildlife habitats within **HABITAT** in the Interior Plateau (Region 5) over the next 10 years,

Action Category:	Rating as “very important” or “moderately important”:	N:
Land/water/species management	87.3%	110
Land/water protection	86.9%	113
Education and awareness	77.9%	102
Livelihood, economic, and other incentives	68.6%	83
Law and policy	66.7%	82
External capacity building	58.3%	63

17. Considering your responsibility within your agency/organization, please indicate whether you have taken a general category of conservation actions for fish and wildlife habitats within **HABITAT** in the **Interior Plateau (Region 5)** since 2005 or have plans to do so.

Threat Category:	Rank	Yes		No	
		%	N	%	N
Land/water/species management	1st	80.0%	80	20.0%	20
Land/water protection	2nd	78.4%	76	21.6%	21
Education and awareness	3rd	78.2%	79	21.8%	22
Livelihood, economic, and other incentives	4th	32.5%	26	67.5%	54
Law and policy	5th	57.9%	44	42.1%	32
External capacity building	6th	36.8%	25	63.2%	43

18. Please indicate the importance of the following specific conservation actions within these general categories for fish and wildlife habitats within HABITAT in the Interior Plateau (Region 5).

Land/Water/Species Management – 1st

Actions directed at conserving or restoring sites, habitats, and the wider environment as well as actions directed at managing or restoring species, focused on the species of concern itself.

Action	Rating as “very important” or “moderately important”	N:
Restore and integrate diversity of habitats into developed landscapes	100.0%	6
Reduce losses of fish and wildlife habitats (due to agriculture, urban sprawl, commercial development, etc.)	93.5%	101
Restore and integrate diversity of habitats into crop-production dominated landscapes	93.3%	14
Restore habitats and natural systems in HABITAT	92.1%	82
Reduce stream bank erosion	90.5%	19
Promote diversity of wetland types and successional stages	90.0%	9
Protect adjacent buffer zones	89.6%	43
Promote diversity of forest types and successional stages	88.2%	30
Increase acres of riparian buffers	85.7%	6
Promote diversity of grassland types and successional stages	85.7%	6
Reduce stream head cutting	85.0%	17
Control invasive species in HABITAT	84.4%	92
Reestablish natural disturbance regimes in HABITAT	83.6%	46
Manage urban woodlots	83.3%	5
Link existing habitat blocks through corridor enhancement in HABITAT	81.7%	89
Develop and promote farming technologies and practices that have conservation benefits (e.g., cover crops, no till)	80.7%	88
Increase acres enrolled in the Classified Forest and Wildlands Program	79.6%	86
Reduce nutrient and toxin loads (e.g., heavy metals, pharmaceuticals, fertilizers, insecticides)	78.5%	84
Decrease number of combined sewer overflow events	77.4%	24
Protect natural water regimes (e.g., withdraws, warm-water discharge)	74.2%	23
Protect and enhance undeveloped shorelines	72.4%	21
Improve integrated pest management	64.3%	9
Improve drainage management	62.4%	63
Control problematic native species in HABITAT	60.6%	66
Decrease E. coli counts	60.0%	18
Mine reclamation	59.8%	52
Species reintroduction. Please specify:	59.1%	13
Reduce recreational overuse of HABITAT	47.4%	36
Manage biofuel grasslands	38.1%	8
Ex situ conservation (protection of a species outside of its natural habitat). Please specify:	34.2%	26
Dam removal	33.3%	10
Remove log jams	33.3%	7

Land/Water Protection – 2nd

Actions to identify, establish, or expand parks and other legally protected areas, and to protect resource rights

Action Category:	Rating as “very important” or “moderately important”:	N:
Acquire currently unprotected HABITAT	89.0%	81
Preserve currently existing corridors	90.2%	101
Acquire conservation easements to protect important wildlife habitats	92.9%	104
Reduce conversion to cropland	81.1%	90
Build/strengthen CRP partnerships	84.0%	89

Education and Awareness – 3rd

Actions directed at people to improve understanding and skills, and influence behavior.

Action Category:	Rating as “very important” or “moderately important”:	N:
Training programs for stakeholders	91.8%	90
Educational programs in general	91.1%	92
Educational programs specifically for K-12	88.2%	90
Improvement of signage and other communication materials in conservation areas	62.4%	63

Livelihood, economic, and other incentives – 4th

Actions to use economic and other incentives to influence behavior

Action Category:	Rating as “very important” or “moderately important”:	N:
Promote nonmonetary values of natural systems within the state	86.4%	70
Promote conservation payment programs (e.g., payment for ecosystem services, conservation easements)	85.4%	70
Manage recreational opportunities to be compatible with fish and wildlife habitats	84.0%	68
Support substitution of alternatives for environmentally harmful products and processes	71.8%	56
Promote market forces (e.g., creation of a nitrogen trading market, promotion of alternative agricultural markets) as a tool for conservation	60.8%	48
Link natural resources to livelihoods through nature tourism	57.8%	48

Law and policy – 5th

Actions to develop, change, influence, and help implement formal legislation, regulations, and voluntary standards.

Action Category:	Rating as “very important” or “moderately important”:	N:
Increase compliance of existing rules and regulations for aquatic systems	94.1%	16
Improve compliance with and enforcement of current policies	89.9%	71
Reduce urban sprawl through planning and zoning	86.4%	70
Change current laws, policies, and regulations. Please specify:	84.0%	42
Increase regulations on invasive species	82.5%	66
Set private sector standards and codes	80.3%	61
Establish submergent vegetation control guidelines	76.5%	13
Establish rules and guidelines for piers and other structures	56.3%	9
Establish legal lake levels	46.7%	7

External capacity building – 6th

Actions to build the infrastructure to do better conservation

Action Category:	Rating as “very important” or “moderately important”:	N:
Promote use of research and science in conservation decision-making processes	95.1%	58
Develop alliances and partnerships (e.g., between producers, landowners, and conservation professionals)	91.9%	57
Increase state’s capacity for research and monitoring of conservation actions	90.3%	56
Strengthen conservation financing	88.9%	56
Promote green infrastructure	82.3%	51
Develop institutions and civil society	66.7%	32